

### **REMARKS**

This responds to the Final Office Action dated June 18, 2005. Claims 1-29 are pending in this application.

#### **Reservation of the Right to Swear Behind References**

Applicant maintains its right to swear behind any references which are cited in a rejection under 35 U.S.C. §102(e). Statements distinguishing the claimed subject matter over the cited references are not to be interpreted as admissions that the references are prior art.

#### **§102 Rejection of the Claims**

Claims 1-29 were rejected under 35 USC § 102(e) as being anticipated by Kadous (U.S. 2001/0036235 A1, “Kadous”). Applicant respectfully traverses the rejection. To anticipate a claim, the reference must teach every element of the claim. *M.P.E.P.* § 2131.

*Regarding claims 1-6:*

Applicant cannot find in Kadous, among other things,  
“receiving an OFDM symbol from a communication channel, said OFDM symbol having a plurality of data subcarriers and a plurality of pilot symbols, and identifying subcarriers of interest,”

as recited in independent claim 1 and incorporated into dependent claims 2-6.

The Office Action states, without pointing to any evidence of record, that herein every channel or subcarrier is considered as an interested subcarrier (*see* Office Action pg. 3). Applicant respectfully submits that considering every channel or subcarrier as an interested subcarrier does not read on the element of “identifying subcarriers of interest” because no identifying then occurs.

Neither can Applicant find any reference to “subcarriers” in Kadous. The Office Action statement listed above apparently uses the terms channel and subcarrier interchangeably. However, Kadous refers to a radio communication channel [that] may be defined within a portion of the electromagnetic spectrum (*see* ¶ 0006) and also refers to multipath channels (*see* ¶ 0008), but does not apparently refer to subcarriers. Kadous further refers to where intersymbol

interference causes distortion of the data (*see* ¶ 0010). The present application refers to subcarriers within each OFDM symbol (*see* pg. 3 lines 14-15), and that symbol modulated subcarriers form a frequency domain representation of the OFDM symbol (*see* pg. 5 lines 12-14). The present application also refers to where in a wireless communication system, ISI (intersymbol interference) is typically present in the form of multipath interference, that is, a transmit signal travels through the wireless channel via multiple different paths that each have a different channel delay (*see* pg. 1 lines 14-17). Further, claim 1 recites in part “receiving an OFDM symbol from a communication channel.” Thus, the terms channel and subcarrier are not interchangeable in either Kadous or in the present application.

Further, Applicant cannot find, “obtaining a first interpolation vector corresponding to a first subcarrier of interest,” as recited in independent claim 1 and incorporated into dependent claims 2-6. Kadous refers to finding an interpolation coefficient for each antenna (*see* Abstract, and ¶0020).

Furthermore, Applicant cannot find in Kadous, “calculating a dot product of said pilot vector and said first interpolation vector to generate an equalization coefficient for said first subcarrier of interest,” as recited in independent claim 1 and incorporated into dependent claims 2-6. The Office Action states that this is disclosed in the cited portions of Kadous that refer to where coefficient interpolator and channel estimator then multiplies interpolation coefficient for each channel by the LS estimator to obtain final channel estimates (*see* Office Action pg. 3). However, Applicant respectfully submits that the final channel estimates referred to in Kadous do not read on the equalization coefficients of the present application. The present application teaches that the equalization coefficients are then used to modify the subcarriers of interest within the received OFDM symbol to reduce or remove undesirable channel effects (*see* pg. 3 lines 22-24). Thus, the equalization coefficients are not final channel estimates.

Further still, Applicant cannot find wherein “generating a pilot vector includes selecting a set of pilot symbols from said OFDM symbol based upon the identities of said subcarriers of interest,” as recited in claim 3. The Office Action states that the LS channel estimate reads on the pilot vector (*see* Office Action pg. 2) and states that the channel estimate de-coupler then decouples the LS channel estimate for each channel, and that this implies that a vector is created which contains an array of LS channel estimates (*see* Office Action pg. 5). As discussed

previously, Applicant can find no disclosure of identities of subcarriers of interest in Kadous and because the terms channels and subcarriers are not interchangeable an array of channel estimates does not read on pilot vectors so generated.

By stating that Kadous implies that a vector is created, the Office Action appears to be making an argument that creating a vector is inherent in Kadous. If so, Applicant respectfully disagrees that *prima facie* inherency has been established. The Office Action has not established a *prima facie* case of inherency because, as recited in MPEP § 2112, “In relying upon the theory of inherency, the examiner must provide basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art,” citing Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original). To serve as an anticipation when a reference is silent about the asserted inherent characteristic, the gap in the reference may be filled with recourse to extrinsic evidence. But, such evidence must make clear that “the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill.” *Continental Can Co. v. Monsanto Co.*, 20 USPQ2d 1746, 1749 (Fed. Cir. 1991). Applicant respectfully submits that the Office Action does not include extrinsic evidence to show that the pilot vector recited in claim 3 is necessarily present in Kadous.

Applicant respectfully requests reconsideration and allowance of claims 1- 6.

*Regarding claims 7-18:*

Applicant cannot find in Kadous, among other things, “means for acquiring an interpolation vector associated with a first subcarrier of interest,” as recited in independent claim 7 and incorporated into dependent claims 8-18. Kadous refers to finding an interpolation coefficient for each antenna (*see* Abstract, ¶0020).

Neither can Applicant find in Kadous, “means for performing a mathematical operation using said interpolation vector and said pilot vector to generate a first equalization coefficient for said first subcarrier of interest,” as recited in independent claim 7 and incorporated into dependent claims 8-18. The Office Action states that this is disclosed in the cited portions of Kadous that refer to where coefficient interpolator and channel estimator then multiplies interpolation coefficient for each channel by the LS estimator to obtain final channel estimates (*see* Office Action pg. 3). However, final channel estimates referred to in Kadous do not read on

the equalization coefficients of the present application. The present application teaches that the equalization coefficients are then used to modify the subcarriers of interest within the received OFDM symbol to reduce or remove undesirable channel effects (*see* pg. 3 lines 22-24).

Applicant respectfully requests reconsideration and allowance of claims 7-18.

*Regarding claims 19-24:*

Applicant cannot find in Kadous, among other things,

“an interpolation vector retrieval unit to retrieve an interpolation vector for each of said subcarriers of interest from a memory,”

as recited in independent claim 19 and incorporated into dependent claims 20-24.

Kadous refers to finding an interpolation coefficient for each antenna (*see* Abstract, and ¶0020).

Neither can Applicant find “a subcarrier tracking unit to track subcarriers of interest,” as recited in independent claim 7 and incorporated into dependent claims 8-18.

Applicant respectfully requests reconsideration and allowance of claims 19-24.

*Regarding claims 25-29:*

Applicant cannot find in Kadous, among other things, “determining a set of subcarriers of interest,” as recited in independent claim 25 and incorporated into dependent claims 26-29. The Office Action states that herein every channel or subcarrier is considered as an interested subcarrier (*see* Office Action pg. 3). Applicant respectfully submits that treating every channel or subcarrier as an interested subcarrier does not read on the element of determining a set of subcarriers of interest.

Additionally, Applicant cannot find, “obtaining a first interpolation vector corresponding to a first subcarrier of interest,” as recited in independent claim 25 and incorporated into dependent claims 26-29. Kadous refers to finding an interpolation coefficient for each antenna (*see* Abstract, and ¶0020).

Further, Applicant cannot find in Kadous, “calculating a dot product of said pilot vector and said first interpolation vector to generate an equalization coefficient for said first subcarrier of interest,” as recited in independent claim 25 and incorporated into dependent claims 26-29. Kadous refers to where coefficient interpolator and channel estimator then multiplies interpolation coefficient for each channel by the LS estimator to obtain final channel estimates (*see* ¶ 0032). However, final channel estimates referred to in Kadous do not read on the

equalization coefficients. The present application teaches that the equalization coefficients are then used to modify the subcarriers of interest within the received OFDM symbol to reduce or remove undesirable channel effects (*see* pg. 3 lines 22-24).

Applicant respectfully requests reconsideration and allowance of claims 25-29.

RESPONSE UNDER 37 C.F.R. 1.116 – EXPEDITED PROCEDURE

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Serial Number: 09/852,376

Dkt: 884.427US1 (INTEL)

Filing Date: May 10, 2001

Title: SPARSE CHANNEL ESTIMATION FOR ORTHOGONAL FREQUENCY DIVISION MULTIPLEXED SIGNALS

Assignee: Intel Corporation

Conclusion

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney at (612) 349-9592 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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Date Oct. 18, 2005

By Ann M. McCrackin  
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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 18<sup>th</sup> day of October, 2005.

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